paper, the chances against it are always very great. Here, then, are three objections to Mr. Romanes' theory which seem to me to be weighty and fundamental; yet he says, in effect, that he anticipated, and is prepared to answer, them. This, I must say, puzzles me; because in the whole of his lengthy paper, occupying seventy-five pages, I cannot find any adequate recognition of their existence, or any attempt whatever to answer them.

My apology for writing this is that I am shortly leaving England, and wish the readers of NATURE, who may not have seen the *Fortnightly*, to be aware of the character of the objections which Mr. Romanes declares that he anticipated, but apparently thought of too little importance to require any discussion in his paper. ALFRED R. WALLACE

I AM sorry that I have not succeeded in making my meaning clear to Mr. Romanes. I had hoped that my former letter (NATURE, September 2, p. 407) would have given some indication as to my father's views. With regard to the sentence quoted from the "Origin of Species," our views seem to differ so much that it seems useless to prolong the discussion.

FRANCIS DARWIN

Golf Club, Felixstowe, September 13

I HAVE read the numerous notes and letters in recent numbers of NATURE upon the origin of species and varieties with great interest. It seems to me that all your correspondents are raising an imaginary difficulty.

"If it is to the advantage of some particular variety not to resemble the parent form," then that variation must have been produced by some efficient cause acting upon the parent form alone. Is it not obvious that that cause still acting will be still more potent in producing that particular variation when the parent form intercrosses with the variety? This is, of course, supposing that the new variety is suitable to its environment; if it is not so, no amount of "propping up," whether by "amixia" or otherwise, would perpetuate it.

If, as is probably the fact, varieties or incipient species have arisen from individual divergences, amixia would tend to immediately suppress them in the case of animals and diœcious plants, as a new generation could not possibly arise without intercrossing with the parent stock. J. H. A. JENNER

4, East Street, Lewes

I SHOULD be glad to call Mr. Romanes' attention to a letter by Mr. Edmund Catchpool, published in NATURE, November 6, 1884 (vol. xxxi. p. 4), where he will find his theory of physiological selection very clearly put forward.

FRANK EVERSHED

113, Darenth Road, Stamford Hill, N.

Solution Discussion at the British Association

IT was a pity there was no discussion on solution in British Association, Section B, on Thursday last. More than the whole day was taken up with reading a great many papers, some of them having very little to do with the subject, so no time was left for discussion. I was indeed, by the courtesy of the Vice-President and the patience of the few remaining listeners, allowed to make a few remarks, but of course it was only possible for me to indicate that I had something to say.

In the papers referred to a good deal was said of solution being due to purely physical causes. Now this is either a truism or a veil to hide ignorance, and I am sure no one was a bit the wiser. What we want to get at is THE physical cause of solution. Again, a great deal was made of the part of the heat of solution that might be accounted for by the contraction in volume of the solution. This looks very learned and scientific, and no doubt is interesting from some points of view, but even if all the heat could thus be accounted for, it would not advance our knowledge of the cause of solution; it is merely surrounding the subject with cobwebs. The question would still remain, What is THE physical cause of this contraction?, and I maintain it is due to the affinity of all the elements for one another acting as pointed out in my papers on chemical affinity and solution published in NATURE, April 29 and July 22 of this year. The truth is, chemists, for convenience of study, drew a circle and called all within this "chemical affinity," and then forgot that the circle was their own making, and imagined it was Nature's work. This restriction has served its day, and must now be obliterated if we would understand the plainest teaching of the laboratory and make continued progress.

Portobello, September 9 WM. DURHAM

Actinotrocha of the British Coasts

IN NATURE of August 19 (p. 361), which I have only seen to-day, my friend, Mr. J. T. Cunningham, records as a novelty the finding in 1883 of *Actinotrocha* off Cromarty Firth. Without giving an exhaustive note of its occurrence off our shores since the discovery in 1856 of *Phoronis* by the late able and accomplished Dr. Strethill Wright, viz. one species from Ilfracombe, and another on an oyster-shell from the neighbourhood of Inchkeith in the Firth of Forth, the following remarks may be of interest. So long ago as 1858 the late Dr. Spencer Cobbold found *Actinotrocha* near Portobello, as was likely after Dr. Wright's discovery, and I have also since met with it in and off the Forth. Moreover, at the meeting of the Microscopical Society at which Dr. Cobbold read his paper, the lamented Dr. Carpenter mentioned that he had found *Actinotrocha* in abundance off the Island of Arran, probably when working at *Tomopteris* and other surface-forms with his friend, the enthusiastic E. Claparède, of Geneva. Besides these localities, Prof. Kölliker ("Kurzer Bericht an der westküste von Schottland," *Zeitsch. f. w. Zool.*, Bd. v. 1864) describes the occurrence of a *Phoronis* apparently identical with Dr. Wright's *P. hippocrepia* from Millport on the larger Cumbrae in the Clyde, a region in which the steam-yacht *Medusa* from Granton has lately been at work. It is probable, indeed, that *Phoronis* and its larval form (*Actinotrocha*) are more generally distributed round our shores than the scanty notices of them would lead one to suppose. Old shells in and off the mouth of the Forth, off the western shores, and these and other structures in the littoral region on the southern coast of England, as well as the shores of the Channel Islands, will probably produce many examples of *Phoronis*, while the careful scrutiny of the contents of the tow-net in similar localities will yield corresponding results as regards *Actinotrocha*. W. C. MCINTOSH

St. Andrews Marine Laboratory, August 25

The Manatee

I NOTICE in the review of Dr. C. Hartlaub's work on the Manatees, which appears in your issue of July 8 (p. 214), that the geographical range ascribed to that animal on the West Coast of Africa has its southern limit at the Quanza. A reference to earlier writers would, I think, justify us in believing that the manatee was once to be found as far south as the Cape of Good Hope, or else that it has been confounded with the hippopotamus.

Dapper, in his description of the Cape Settlement, speaks both of sea-cows—"zee-koeien of zee duivels, zoo groot als koeien, die bij wijlen te lande gaen weiden"—and of sea-horses —"zee-paerden, een zeer groot en wonderijgelyk zee-gedrocht" ("Naukenge Beschrijonige der Afrikaensche gewesten," p. 266; Amsterdam, 1676).

Here the hippopotamus is evidently the *zee-koe* or sea-cow, which occasionally feeds on dry land. May not the *zee-gedrocht*, the sea-monster, have been the manatee?

For Valentyn, also writing of the Cape of Good Hope, refers very explicitly to the manatee:—

"Onder de zee dieren telt men de zee koejen, de hier zeer veel en ongemeen swaar vallen, alzoo men er zommige van 4 of 5000 ponden gezien heeft. In West Indien *noemt men dit dier Manati* bij de Indianen, en anderen noemen het wel een Lamantine; hoewel er zijn die beide deze dieren nog eenigzins onderscheiden.

"Diergelijk zwaar zee paarden heeft men er ook, hoewel wat verder van de Kaap af, gezien. Zij vallen doorgans kastaniebruin" ("Beschrijung van Kaap de Goede Hoop," p. 115; Dordrecht and Amsterdam, 1726. Eighth volume of "Oud en Nieuw Oost Indien").

But here the manatee is called the sea-cow. What is the sea-horse (*zee-paarden*)? Can it be what Leguat saw at sea on his voyage from Amsterdam to the Cape—which he reached twelve days after the *rencontre?*

"Le premier jour de l'an 1691 nous eûmes le plaisir de voir assez distinctement une vache marine de couleur roussâtre (cf. the "kastaniebruin" of Valentyn) "qui faisoit voir la tête entière, et quelquefois de la moitié du corps hors de l'eau. Elle était ronde et épaisse et paraissoit plus massive que nos plus grandes vaches. . . . Un de nos matelots nous assura que ces animaux avoient les pieds, comme vous pouvez voir dans la figure que voici."

This figure, however, except for the toes, which resemble fins or webbed feet, is unmistakably the hippopotamus! (See "Voyage et Avantures de François Leguat," vol. i. p. 35; Londres, 1708.) Leguat did not apparently consider it a manatee, for on p. 93 he gives a full description, with plate, of the lamentin or manati, which "se trouve en grande abondance dans les mers de cette Isle" (Rodriguez). The skin is "noirâtre."

Père Tachard plainly calls the hippopotamus the *vache marine*—he is speaking of the Cape: "on voit dans les grandes Rivières un animal monstrieux, qu'on appelle Vache Marine, et qui égale le Rhinocéros en grandeur" ("Voyage de Siam," vol. i. p. 78; Amsterdam, 1688). The plate accompanying is the hippopotamus, and we know that the Dutch colonists have always called this pachyderm the "zee-koe."

Kolbe ("Caput bonae spei hodiernum," p. 167, Nürnberg, 1719) speaks of the "zee kuh," the "meer kuh," the "zee pferd," and the "kuh fisch," all of which he appears to consider different names for the hippopotamus, notwithstanding that "in dem Tartarisch meere grosse Küh-Fische schwemmern, die grosser als unsere Kühe in Europa waren, aber weder Schuppen noch Hörner hatten." This must be the dugong, surely.

Bogaerts ("Asia," p. 105; Amsterdam, 1711) distinguishes between "zee-paarden" and "zee-koien."

Dampier's mention of the manatee is probably well known:—"While we lay here (Blewfield River, between the Nicaragua and Veragna Rivers) our Moskito men went in their canoa and struck us some manatee or sea cow. Besides this Blewfield River I have seen of the manatee in the Bay of Campeachy, on the coast of Bocca del Drago and Bocco del Toro, in the River of Darien, and among the South Keys or little Islands of Cuba. . . . I have seen them also at Mindanea, one of the Philippine Islands, and on the coast of New Holland." Then follows a full description (see Dampier's "Voyage Round the World," vol. i. p. 33 *et seq.*, also pp. 2, 9, 41, 381, 463, and 547; London, 1729). Dampier also points out that the so-called manatee of St. Helena is really a "sea-lion."

Cape Town, August 4 W. HAMMOND TOOKE

Time Reform in Japan

THE following communication may perhaps interest your readers.

On my return home from America and Europe, I presented a report on the resolutions of the International Meridian and Time Congress, held at Washington last year, to which I was sent as a delegate. A Committee was appointed to discuss the matter contained in my report, and reported favourably. The following decree was issued on July 12, 1886, under the Imperial seal:—

(1) The meridian passing through the centre of the transit instrument at the Observatory of Greenwich shall be the initial meridian for longitude.

(2) Longitude shall be counted from this initial meridian in two directions up to 180°, east longitude being + and west longitude –.

(3) On and after the first day of the first month of the twenty-first year of Meiji (January 1, 1888), the time of the meridian of 135° E. shall be used as the standard time throughout the empire. D. KIKUCHI

Science College, Imperial University, Tokio, Japan

Tremblement de Terre du 5 Septembre

L'ÉBRANLEMENT des couches terrestres, qui peut être considéré comme la suite du tremblement du 27 août, a eu son centre dans le Piémont, dans les environs de Suse, au pied du Mont-Cenis. Le phénomène a été composé des secousses suivantes, qui ont toutes été très-faibles dans la Suisse.

Secousses préparatoires. 4 septembre, 11h. 35m. soir (heure de Berne) Colombier (Neuchâtel); 5 septembre, 8h. 16m. soir, Briançon (Hautes-Alpes, France).

Grande secousse. 5 septembre, 8h. 55m. soir. Nous en avons des observations de Bienne, Berne, Lausanne, Morges, Genève, Vevey, Aigle, Villars-sur-Ollon, Bex, Mouthey, Trois-torrents, Sion, Savièse.

Secousses consécutives. 5 septembre, 11h. 55m. soir, Genève; 6 septembre, 4h. 10m. matin, Mouthey (Valais); 7 septembre, 0h. 43m. matin, Genève. F.-A. FOREL

Morges, 12 septembre

Lunar Rainbow

A BEAUTIFUL lunar rainbow was plainly visible here for a few moments last evening. The eastern sky being clear, the moon looked fully out from behind dark clouds in the west at a moment when rain was falling lightly. Turning quickly away from her light, in the hope of seeing a bow, I was not disappointed. A semicircle of pale, whitish light, was projected against the eastern sky, much smaller in diameter, apparently, than a sun-bow, and without any traces of colour.

Reflecting on the circumstance that repeated efforts have never, previously, enabled me to see a lunar bow, although the conditions necessary for its formation are common enough, I am tempted to think that the phenomenon can only be seen when the atmosphere is unusually clear. The light issuing from the bow is so faint that the slightest mistiness of the air intervening between itself and the spectator is probably sufficient to, practically, extinguish it. Last night the air here and over the Channel was extraordinarily pellucid, lights on the French coast which are hardly ever seen being plainly visible, while others, nearer neighbours, flashed with most unusual brilliancy.

D. PIDGEON

Arthur Villa, Hythe, Kent, September 6

Aurora

THE aurora seen in Ireland on July 27, and described in NATURE, August 5, p. 312, was visible in this vicinity. It was the finest observed thus far this year, with the exception of that of May 8. Other dates on which the aurora has been seen in this locality recently are as follows: June 29, June 4, and April 14. It has been noted that these appearances of the aurora have been coincident with the return of the disturbed area on one side of the sun (see NATURE, July 22, p. 278), and likewise with widespread and violent storms.

Lyons, New York, August 25 M. A. VEEDER

THE SOLAR ECLIPSE OF AUGUST 29

THE following communication, dated Grenada, September 5, is published by the *Times* from its correspondent with the Eclipse Expedition. It should be compared with the communication made by Prof. MacAlister to Section A at the Birmingham meeting of the British Association (NATURE, September 9, p. 441), and with the article in the same number (p. 437), describing the arrangements for observation.

"The observations of the corona during the last two eclipses, including that observed in Egypt, have been confirmed by the present. Capt. Darwin's observations with the coronagraph seem disappointing, the glare of irradiation from the body of the sun, and not the true corona, being visible on his plates. The bright lines seen in the spectra of the prominences are displaced in such a direction as to prove that there is in them a downrush of gas towards the sun.

"The curious prolongation of the corona observed on several previous occasions to occupy the sun's equatorial plane, does not appear in any of the photographs taken, though it was visible at all the stations except Mr. Lockyer's."

PHOTOGRAPHY OF THE SOLAR CORONA

UNDER the above title we have received the following communication with reference to the results of the recent eclipse observations:—

Accounts have appeared in your journal of my attempts to photograph the corona of the sun without an eclipse. Many of the plates obtained presented appearances which seemed not to myself only, but to several scientific men who must certainly be con-